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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/553,431	04/19/2000	Katherine W. Osteryoung	920905.90041	3961

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EXAMINER
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KUBELIK, ANNE R

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/553,431	OSTERYOUNG, KATHERINE W.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Anne R. Kubelik	1638	

**-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 July 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8, 10 and 14-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 and 8 is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-7, 10, 14-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on with the application is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

1. Claims 1-8, 10 and 14-28 are pending.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825.

Sequence identifiers are missing from either the Brief Description of Figure 1.

Full compliance with the sequence rules is required in response to this Office action. A complete response to this Office action must include both compliance with the sequence rules and a response to the issues set forth herein. Failure to fully comply with both of these requirements in the time period set forth in this Office action will be held to be non-responsive.

***Response to Amendment***

4. The objection to claims 6, 16, 19, 22, 26 and 28 is WITHDRAWN in light of amendment to the claims.
5. The rejection of claim 29 under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for alteration of size, shape and/or number of plastids in *Arabidopsis* via antisense expression of SEQ ID NO:1, does not reasonably provide enablement for alteration of size, shape and/or number of plastids in any plant via antisense expression of SEQ ID NO:1 is WITHDRAWN in light of its cancellation.

***Claim Rejections - 35 USC § 112***

6. Claims 1-2, 4-5, 7, 10, 14-15, 17-18, 20-21, 23-24 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Neither the instant specification nor the originally filed claims appear to provide support for the phrase “the MinD protein ... having at least 80% sequence identity with SEQ ID NO:2 and (c) the MinD protein includes sequences ... respectively of SEQ ID NO:2”.

Thus, such a phrase constitutes NEW MATTER. In response to this rejection, Applicant is required to point to support for the phrase or to cancel the new matter.

7. Claims 1-2, 4-5, 7, 10, 14-15, 17-18, 20-21, 23-24 and 27 remain rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an *Arabidopsis* MinD gene encoding SEQ ID NO:2, plants transformed with that gene, and methods of using that gene to alter size, shape and/or number of plastids, does not reasonably provide enablement for any MinD coding sequence from any source, plants transformed with any MinD coding sequence, or methods of using any MinD coding sequence to alter size, shape and/or number of plastids. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The rejection is repeated for the reasons of record as set forth in the Office action mailed 13 January 2003, as applied to claims 1-2, 4-5, 7, 10-12, 14-15, 17-18, 20-21, 23-24 and 27. Applicant's arguments filed 17 July 2003 have been fully considered but they are not persuasive.

Applicant urges that that they are entitled to claims broader than the specific *Arabidopsis* MinD sequence, but have amended the claims to recite a further structural limitation of the protein; as amended the claims now recite three characteristics of the protein encoded by the claimed nucleic acid. Applicant urges that functional and structural defining information is now provided. Applicant urges that there is nothing overbroad about the claims; they are directed toward a specific gene expressed in plants and that has a specific function and structure. Applicant urges that the claims require a specific 20 amino acid sequence that is highly conserved among MinD proteins and is thus highly likely to be very important to the functionality of these proteins (response pg 9-10).

This is not found persuasive. The instant specification fails to teach plant MinD sequences encoding MinD proteins with 80% identity to SEQ ID NO:2 and that have the 20 amino acid long region. The Tagetes protein has 92% identity to the Arabidopsis protein (specification, pg 7, lines 9-11), and thus does not provide guidance for nucleic acid encoding proteins with 80% identity to SEQ ID NO:2. The specification also fails to provide guidance for the construction or isolation of such sequences. The specification also fails to teach any Arabidopsis MinD gene other than SEQ ID NOs:1.

SEQ ID NO:1 encodes a 326 amino acid long protein. Even if the sequence of 20 amino acids is specified, making all possible single amino acid substitutions in an 326 amino acid long protein like that encoded by SEQ ID NO:1 would require making and analyzing  $19^{306}$  nucleic acids. Because nucleic acids encoding proteins with 80% identity to SEQ ID NO:1 would encode proteins with 65 amino acid substitutions, many more than  $19^{306}$  nucleic acids would need to be made and analyzed. Applicant has only described two sequences, and has not provided guidance for which 65 amino acids of SEQ ID NO:2 are to be altered.

The specification also does not teach the structural features that distinguish nucleic acids that encode MinD proteins with 80% identity to SEQ ID NO:2 from those that encode nonfunctional proteins with 80% identity to SEQ ID NO:2.

Applicant urges that in addition to the *Arabidopsis* and *Tagetes* sequences set forth in full in the specification, the specification also describes the partial sequence of the rice protein sequence and that protein sequence includes the 20 amino acid motif (response pg 10).

This is not found persuasive because the protein sequence is only partial and because the specification does not teach the sequence of the gene that encodes this protein.

8. Claims 1-2, 4-5, 7, 10, 14-15, 17-18, 20-21, 23-24 and 27 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The rejection is repeated for the reasons of record as set forth in the Office action mailed 13 January 2003, as applied to claims 1-2, 4-5, 7, 10-12, 14-15, 17-18, 20-21, 23-24, 27 and 29. Applicant's arguments filed 17 July 2003 have been fully considered but they are not persuasive.

Applicant urges that that they are entitled to claims broader than the specific *Arabidopsis* MinD sequence, but have amended the claims to recite a further structural limitation of the protein; as amended the claims now recite three characteristics of the protein encoded by the claimed nucleic acid. Applicant urges that functional and structural defining information is now provided. Applicant urges that there is nothing overbroad about the claims; they are directed toward a specific gene expressed in plants and that has a specific function and structure. Applicant urges that the claims require a specific 20 amino acid sequence that is highly

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conserved among MinD proteins and is thus highly likely to be very important to the functionality of these proteins (response pg 9-10).

This is not found persuasive. The instant specification fails to describe the sequence of any MinD gene encoding a MinD protein with 80% sequence identity to SEQ ID NO:2. The specification only described nucleic acids encoding a MinD protein with 92% identity to SEQ ID NO:2. No description is provided as to the structural features that distinguish all such plant MinD genes from other plant genes, and no description is provided as to essential motifs that define MinD genes. The specification does not describe the structural features that distinguish nucleic acids that encode MinD proteins with 80% identity to SEQ ID NO:2 from those that encode nonfunctional proteins with 80% identity to SEQ ID NO:2.

Applicant urges that in addition to the Arabidopsis and Tagetes sequences set forth in full in the specification, the specification also describes the partial sequence of the rice protein sequence and that protein sequence includes the 20 amino acid motif (response pg 10).

This is not found persuasive because the protein sequence is only partial and because the specification does not describe the sequence of the gene that encodes this protein.

9. Claims 1-8, 10 and 14-28 are free of the prior art, given the failure of the prior art to teach or fairly suggest methods of altering the size, shape and/or number of plastids in plant cells by transformation with a sense or antisense MinD gene, the constructs used in that method, or the plants or seeds so obtained. The prior art also fails to teach or suggest a nucleic acid of SEQ ID NO:1.

10. Claims 3 and 8 are allowed.

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*Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (703) 308-5059. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Customer Service at (703) 308-0198.

Anne R. Kubelik, Ph.D.  
October 1, 2003



AMY J. NELSON, PH.D  
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